NUMERICAL ISSUES IN THE IMPLEMENTATION OF SLIP BOUNDARUY CONDITIONS

L.L. Ferrás[1]; O.S. Carneiro[1]; F.T. Pinho[2]; J.M. Nóbrega[1]

[1] *I3N/IPC-Institute for Polymers and Composites, University of Minho*
[2] *Centro de Estudos de Fenómenos de Transporte, Faculdade de Engenharia da Universidade do Porto*

It is well known that some fluids show a discontinuity in the velocity field near solid walls, suggesting the existence of slip velocity that depends on the wall shear stress. This phenomenon is very important from the practical point of view, especially for polymer melts that incorporate slip additives, usually employed as processing aids. In order to account for this issue the boundary conditions of a in-house computational rheology code were improved, adding to the usual Dirichlet and Neumann boundary conditions applied, for the *no slip* and *free slip* behaviour, a relationship between the slip velocity and the shear stress vector of the fluid near the wall. The numerical implementation of slip boundary conditions brings convergence complications. These issues will be explained and new techniques will be presented in order to suppress the difficulties.